

An investigation of the efficiency....S/114/60/000/010/009/011/XX
E194/E155

over the height of the tube as a function of the throughput, the percentage of deposit being plotted on the y axis and the height of the centrifuge on the x axis; the throughput is denoted by the figures on the curves, kg/hour. It will be seen that as the throughput is increased the slope of the deposit increment curve alters because the water is not completely purified. At the rated throughput of 10-12 kg/hour the amount of deposit on the top sections of the tube is small, but it increases at higher throughputs. Two tests were made on condensate from a Moscow Heat and Electric (District Heating) Power Station where all the condensate passes through a mechanical filter charged with sulpho-carbon. Before purification the condensate contained 0.2-0.3 ppm iron; after mechanical filtration the iron content became 0.04-0.06 ppm and after centrifuging it was not greater than 0.01-0.02 ppm. Similar results were obtained with plate-type super-centrifuges, in which the best purification was obtained on low-output separators with a gap between plates of 0.1 mm. The tests have demonstrated the possibility of removing nearly all the ferrous corrosion products from water.

LIPATOV, N.S.

Classification of nonsingular gravitational fields by groups
of homothetic motions. Uch. zap. GGPI no.41:67-76 '62.
(MIRA 16:10)
(Spaces, Generalized)

LIPATOV, N.S. (Penza)

Three-dimensional Riemann spaces admitting of groups of nontrivial
homothetic movements. Volzh. mat. sbor. no.1:118-137 '63.
(MIRA 19:1)

HUGH HANCOCK and ARTHUR HANCOCK, "The Effect of Hypertension on the Reflexes of the Human Hand," *Journal of Neurology*, 1964, 201, 1-10.

and only after a month and a half did they begin to recede; in others a decrease of reflexes began at the

Card 1/2

- 159 -

USSR/Human and Animal Physiology - The Effect of Physical Factors. T
Ionizing Radiation.

Abs Jour : Ref Zhur Biol., No 3, 1959, 13401

time of radiation or immediately after it without the phase of elevation. However, in all the dogs there occurred a weakening of the processes of stimulation and inhibition. With radiation with total doses of 300 and 600 r in all cases along with a decrease in the intensity of conditioned reflexes there were observed hypnotic phases - compensating, paradoxical, and sometimes ultraparadoxical also. In all the series of the investigation unconditioned reflexes increased after total irradiation. -- N.A. Volkova

(over) p/p

LITATOV, N. N.

Cream Separators

Method of extracting butterfat from milk. Sotz. shiv. 14 no. 4:70-80 ap '52.

Monthly List of Russian Accessions, Library of Congress, July 1952. Unclassified

LIPATOV, SERGEY MIKHAYLOVICH

DECEASED

b1877 - a - JAN 8, 1961

SEE ILC

CHEMISTRY

L 32711-66

ACC NR: AT6015111

SOURCE CODE: UR/3199/66/000/012/0066/0079

AUTHOR: Badinov, I. Ya.; Andreyev, S. D.; Lipatov, V. B.

46
B+1

ORG: none

TITLE: Humidity measurements in the upper atmosphere

SOURCE: AN SSSR. ^{am} Mezhdunarodstvennyy geofizicheskiy komitet. Meteorologicheskiye issledovaniya, no. 12, 1966, 66-79

TOPIC TAGS: atmospheric humidity, ~~water vapor~~, upper atmosphere, stratosphere, solar spectrum, meteorologic balloon, spectrophotometer, ATMOSPHERIC WATER VAPOR

ABSTRACT: A critical summary of measurements of upper atmospheric humidity (by airborne investigations using a condensation hydrometer, spectral investigations over England, and measurements in the USSR) is given. Detailed descriptions of the atmospheric humidity measurements carried out by automatic balloon solar spectrophotometers are given. The solar spectrophotometers were designed by the Department of Atmospheric Physics of Leningrad University. The instruments recorded the solar spectrum within the region of 0.4-13 microns. A spectrum up to 25-28 km was recorded. The integral content of water vapor above various levels was defined by the bands 0.94, 1.13, 1.39, 1.87, and 6.3 microns. On 23 October, about 1 micron of water vapor was found above the 28-km level. A small content of water vapor (on

Cord 1/2

L 32711-66

ACC NR: AT6015111

0

the order of 10^{-6} g/g) was confirmed in the stratosphere by other ascents. In this connection, the authors critically consider the measurements of other investigators and have come to the conclusion that humidity increases with altitude, obtained in isolated investigations, are caused by the pollution brought in by the balloon and apparatus. Analysis of all recent measurement results leads to the conclusion that the concept of the humid stratosphere is unfounded. Orig. art. has 3 figures.

[BT]

DDI CODE: 04/ RUM DATE: none/ ORG REF: 01/ OTH REF: 02)

Card

2/2 BLG

LIPATOV, V.I.

"Moscow Secretedary: Incidents at the 131-Union Agricultural Exhibit,"

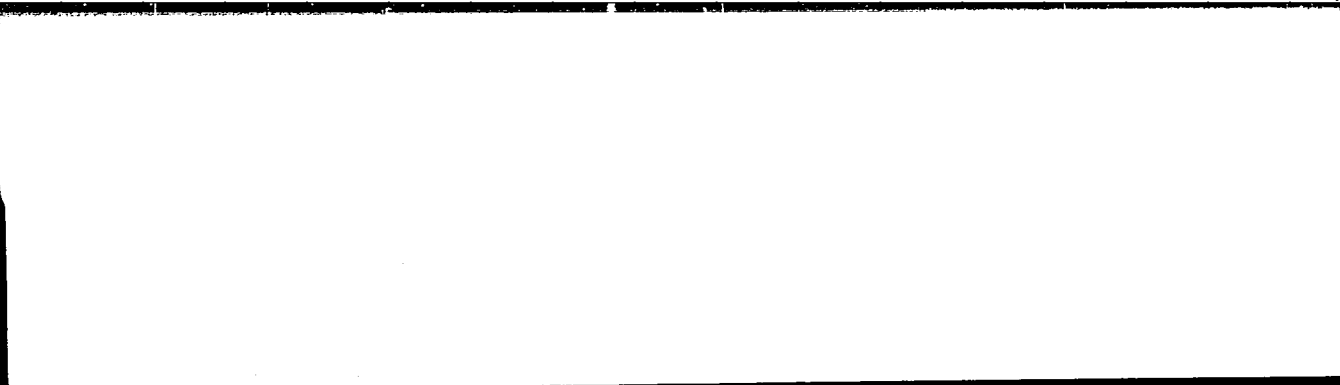
CC: Sov Vet, Vol 14, No 4, pp 9-10, 1989.

LIPATOV, V.I. (g.Beragovo, Zakarpatskoy obl.)

✓
▲ rare case of serious intoxication after a wasp sting. Vrach.
delo no.2:181-183 P '59. (MIRA 12:6)
(VENOM--PHYSIOLOGICAL EFFECT)

"APPROVED FOR RELEASE: 07/12/2001

CIA-RDP86-00513R000930020003-4



APPROVED FOR RELEASE: 07/12/2001

CIA-RDP86-00513R000930020003-4"

L 40761-65

ACCESSION NR: AP5012327

UR/0286/64/000/022/0072/0072

AUTHOR: Lipatov, V. I.; Mitel'man, B. I.; Rozenberg, G. D.; Shumilov, L. P.

TITLE: Capillary viscosimeter of the closed type. Class 42, No. 166537

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 22, 1964, 72

TOPIC TAGS: viscous flow, viscous fluid, laboratory instrument

Translation: This inventor's certificate introduces a capillary viscosimeter of the closed type for measuring the rheological characteristics of non-Newtonian fluids under normal conditions and under high temperature and pressure conditions. The instrument consists of two thick-walled thermostatically controlled vessels (bombs) connected by a measuring line, a device for forced compression of the fluid being tested and a system for measuring pressure drops. In order to increase the accuracy in determining the rheological characteristics of the fluid being tested, the device for forced compression of the fluid is made in the form of balanced hydraulic plungers of different diameters. These plungers can be moved in any

Card 1/2

combination with one another or each individually on a common base. The measuring line consists of a capillary tube of a certain diameter but different length with identical geometry for the input and output of the fluid being studied.

Orig. art. has: 1 figure.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'sky institut burovoy tekhniki (All-Union Scientific Research Institute for Drilling Technology)

SUBMITTED: 00

ENCL: 00

SUB CODE: ME, GP

NO REF SOV: 000

OTHER: 000

JPRS

Card 2/2

L 2344-66 EWT(1)/EWP(m)

ACCESSION NR: AT5022113

UR/3136/64/000/614/0001/0019

AUTHORS: ^{44,55}Flerov, N. N.; ^{44,55}Lipatov, V. P.; Aref'yev, A. V. ^{44,55}

32
29
B+1

TITLE: Redesign of a linear electron accelerator of the Institute for Atomic Energy ^{44,55}

ABSTRACT: Moscow, Institut atomnoy energii. /Doklady/, IAE-614, 1964. Nakombrukbulya

Page 1/1

L 2344-66

ACCESSION NR: AT5022113

3
magnetron modulator; 5) regulating the power supply of the thyatron heaters; 6) controlling the electron trajectory by corrective magnetic fields generated by suitable solenoids distributed along the electron path; 7) redesigning the electron injector. Schematics of the klystron modulator, uranium target, triode injector and impulse injector power supply are on Fig. 1. M. I. Basalayev and colleagues of the RTI took part in the redesign. Orig. art. has: 8 graphs. 44,55

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute for Atomic Energy)

SUBMITTED: 00

ENCL: 01

SUB CODE: NP

NO REF SOV: 010

OTHER: 002

Card 2/3

L 2344-66
ACCESSION NR: AT5022113

ENCLOSURE: 01

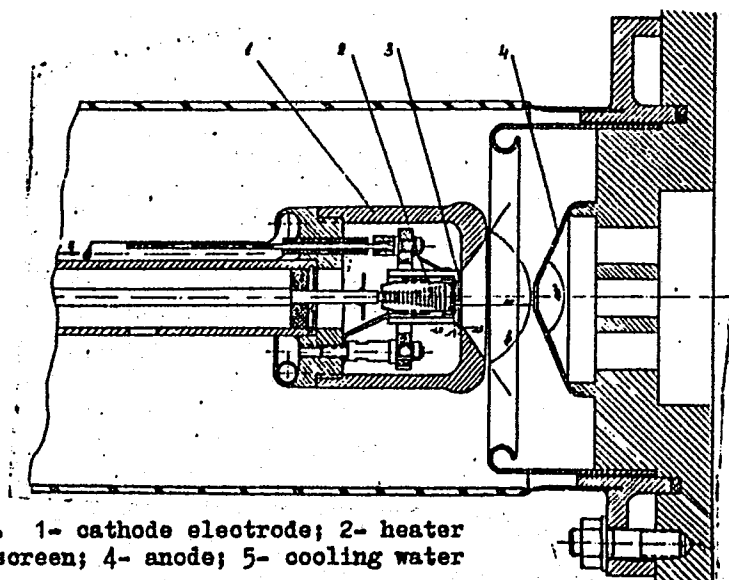


Fig. 1. Triode injector. 1- cathode electrode; 2- heater and cathode of LaB₆; 3- screen; 4- anode; 5- cooling water

Beh
Card 3/3

L 61904-65 EWT(d)/EWT(1)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/T-2/EWP(k)/EWP(h)/EWP(1)

ACCESSION NR: AP5021628

JD/EM

UR/0286/65/000/013/0110/0110

629.13.01/06

620.178

44
B

AUTHOR: Lipatov, V. R.

TITLE: Stand for blade vibration in the resonance testing of a rotor model.
Class 62, No. 172636

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 13, 1965, 110

TOPIC TAGS: blade vibration, rotor blade, test stand, rotor model

ABSTRACT: An Author Certificate has been issued for a stand for blade vibration in the resonance testing of a rotor model with a rotor carrying shaft, drive cams, conical reducers, gears, and a rotating platform. To induce continuous vibrations of the rotating blade with a variable frequency for a constant number of rotor revolutions, a cylindrical gear is mounted coaxially on the rotor shaft and rotated by an electric motor (see Fig. 1 of Enclosure). Orig. art. has: 1 figure. [PS]

ASSOCIATION: Organizatsiya gosudarstvennogo komiteta po aviatsionnoy tekhnike SSSR (Organization of the State Committee on Aviation Technology, SSSR)

Card 1/3

44,55

L 61904-65

ACCESSION NR: AP5021628

SUBMITTED: 05Feb64

ENCL: 01

SUB CODE: P, IE

NO REF SOV: 000

OTHER: 000

ATD PRESS: 4072

Card 2/3

I 61904-65

ACCESSION NR: AP5021628

ENCLOSURE: 01

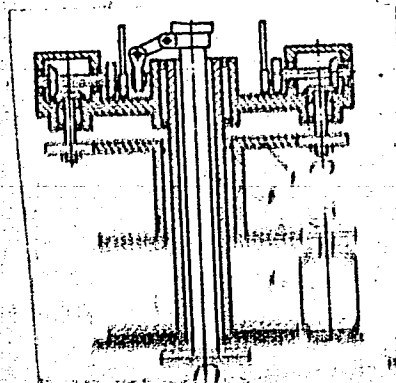


Fig. 1. Blade vibration test stand

1 - Cylindrical gear; 2 - rotor shaft; 3 - electric motor.

Card 11/3000P

LIPATOV, V.S., inzh.; YULGZHANIN, V.P., inzh.

Static three phase bridge-type converter. Elektrotehnika 36
no.6:36-38 Je 1965. (MIRA 18:7)

LEPATOV, Ya. A.

Automatic out-putting machine. Stan. 1 inter. 20 no. 211 No. 13.
(H. 114 and 1144) (H. 1144 and 1144) (H. 1144 and 1144)

L 58848-65 EWI(1)/EWG(m)/EWA(h) Feb

ACCESSION NR: AP5014485

UR/0292/65/000/006/0036/0038
621.314.252AUTHOR: Lipatov, V. S. (Engineer); Vylegzhanin, V. P. (Engineer)10
BTITLE: Bridge-type three-phase static inverter 25SOURCE: Elektrotehnika, no. 6, 1965, 36-70

TOPIC TAGS: dc ac inverter, semiconductor inverter

ABSTRACT: The development of a new d-c / 3-phase-a-c transistorized inverter is reported. The inverter comprises 6 interconnected half-bridge-type self-excited oscillators with transformer-type feedbacks; the oscillators form a ring-scaler circuit synchronized in a definite sequence by a master-oscillator signal. The square base voltage is ensured by separation of the functions of transistor switching and output-voltage shaping. Two 45-v-dc 1000-cps experimental models were built and tested; the stepped-base-voltage model developed 220 va at 0.71 efficiency while the square-base-voltage model yielded 420 va at 0.82 efficiency. The latter model exhibited stability of operation at -50+65C, and its load characteristic had a slope of only 0.006 v/va. Orig. art. has: 6 figures, 15 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 00

Card 1/1 gph

ENCL: 00

NO REF SOV: 002

SUB CODE: EC, EE
OTHER: 000

...ed the scheme of which is shown by an illustration. This machine had a drum by means of which the automatic feed of rivets is carried out. The operation of the machine is described.

Technical characteristics of the semiautomatic machine:

- 1) rivets ϕ in mm 2,2 - 3,0
- 2) length of rivets in mm 4 - 13
- 3) bore ϕ in mm 1,0 - 1,5
- 4) depth of bore in mm 3,0
- 5) number of turns of spindle per minute 2.800
- 6) number of double lifts of spindle per minute -63
- 7) motor power kw 0,37
- 8) performance per hour 2.000

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress
Card 1/1

28(1)

SCV/117-59-6-6/33

AUTHOR: Lipatov, Ye. G.
TITLE: An Automatic Thread-Cutting Machine for Nuts
PERIODICAL: Mashinostroitel', 1959, Nr 6, pp 14-16 (USSR)
ABSTRACT: Information is given on the design and operation of
a special thread-cutting automatic machine developed
and tested at the "Avtomatika" ("Automation") Plant.

LIPAROV, Ye.G.

Automatic counterboring machine for nuts. Mashinostroitel'
no.10:24 0 '61. (MIRA 14:9)
(Drilling and boring machinery)

LIPATOV, Ye.G.

Double pneumatic pressing head for die-casting machines. Priboro-
stroenie no.7:22-23 JI '63. (MIRA 16 :9)

LIPATOV, Ye.G.

Dual pneumatic pressing head for die-casting machines. Avt. prom.
30 no.7:42 J1 '64. (MIRA 17:9)

1. Vladimirskiy zavod "Avtopribor".

LIPATOV, Ye.G.

Improved design of a pot for die-casting machines. *Avt.prom.*
30 no.11:45 N '64 (MIRA 18:2)

1. Vladimirskiy zavod "Avtopribor".

LIPATOV, Ye.G.

Improving the design of containers for machines with hot extrusion
chambers. Lit. prelzy. no.1:49 Ja '65.

(U) (S) (C)

LIPATOV, Yu. S.

Oct 51

USSR/Chemistry - Petroleum

"Effect of Boron Trifluoride on the Cracking of Hydrocarbons," Ya. M. Panchik,
Yu. S. Lipatov

"Zhur Obshch Khim" Vol XXI, No 10, pp 1794-1799.

Cracked diesel oil over activated C and aluminosilicate, with and without presence of BF_3 . With BF_3 on activated C starting material became denser, yield of light fractions was reduced (due to polymerizing action of BF_3). BF_3 on carbon inhibits cracking above 450°. BF_3 on aluminosilicate increased yield of light fractions, octane number of gasoline fraction. BF_3 reduced yield of unsatd hydrocarbons when added to either of the 2 catalysts.

PA 194T25

USSR/Chemistry - Cracking

1 Feb 51

"Inhibition and Activation of Cracking Over Carbon and Aluminosilicates," Ye. M. Pashkin, Yu. S. Lipator

"Dok Ak Nauk SSSR" Vol LXXVI, No 4, pp 547-550

Diesel fuel was cracked over catalysts in question in presence of boron fluoride. Over-activated carbon, addn of boron fluoride cuts in half yield of gasoline, lowers bromine number of resulting gasoline, and increases yield of gas and content of unsatd compd in the gas. With aluminosilicate catalyst, addn of boron fluoride increases yield of gasoline by 15-45% depending on temp, lowers sp gr of the gasoline, above 400

17619

USSR/Chemistry - Cracking (contd)

1 Feb 51

reduces content of unsatd com in gasoline and gas, and raises octane number of the gasoline by 0.7 to 66.8.

17619

LIPATOR, Yu. S.

LIPATOV, Yu S.

"Study of Orientation in Crystalline and Amorphous Polymers."
Cand Chem Sci, Sci Res Physiochemical Inst, Moscow, 1954. (RZhFiz,
Mar 55)

SO: Sum. No. 670, 29 Sep 55—Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institutions (15)

LIPATOV YU. S.

USSR/Chemistry - Physical chemistry

Hand 1/1 File 00 1190

Authors : Kargin, V. A., Academician; Karpov, V. L.; Lipatov, Yu. S.; Markova, O. S.; and Koretskaya, T. A.

Title : About the phase condition of hydrate cellulose films

Periodical : Dok. AN SSSR 101/4, 707-709, Apr 1, 1955

Abstract : The phase condition of hydrate cellulose compounds obtained through three different methods was investigated by means of electrons with an energy of 90 kev. The existence of foreign crystalline inclusions in the cellulose films even after 3 days of thorough washing was established electronmicroscopically. A study of the entire conversion process - from isotropic, swollen hydrate cellulose into highly orderly arranged fibers - showed that the phase conversions do not affect the complete conversion process. The fact that cellulose compounds are amorphous was confirmed. Thirteen references: 10 USSR, 2 German and 1 USA (1917-1953). Table; illustrations.

Institution :

Submitted : November 11, 1954

Lipatov, Yu. S.

Heat propagation in oriented polymers. V. A. Kargin,
G. I. Slonimskii, and Yu. S. Lipatov. *Doklady Akad.*
Nauk S.S.S.R. 104, 104 (1955). Polystyrene, poly-
(methyl methacrylate), capron, and polyethylene were
tested for heat anisotropy in their oriented amorphous and
cryst. states. The orientation was done by stretching to
corresponding elongations. A thin layer of readily fusible
material (wax + oil) was spread over the oriented sample
surface, and an electrically heated "point" heat source
was used, consisting of a truncated cone with 0.7 sq. mm.
cross-section. Anisotropic bodies form elliptic fusion figures,
whereas round figures are formed by nonanisotropic bodies.
The results indicate that oriented cryst. polymers exhibit
anisotropy; amorphous ones do not. W. M. S.

0046

MA

LIPATOV, YU.S.

Category : USSR/Atomic and Molecular Physics - Physics of High-Molecular Substances

D-9

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3620

Author : Lipatov, Yu.S., Kargin, V.A., Slanimskiy, G.L.

Inst : Physicochemical Institute, imeni L.Ya., Karpov, Moscow

Title : Investigation of the Orientation in High-Polymers. I. Amorphous Polymers

Orig Pub : Zh. fiz. khimii, 1956, 30, No 5, 1075-1081

Abstract : A determination of the heat of dissolution and a study of the vapor sorption were made for oriented and unoriented films of polystyrene, polyvinyl chloride, polymethyl metacryllate, and cellulose acetate (the latter also in the form of acetate silk). The results obtained show that the orientation of the first three polymers decreases the packing density, and orientation of the cellulose acetate causes it to increase. This is explained by the kinetic nature of the re-grouping processes of the molecules upon orientation and their dependence on the flexibility of the chain, on the magnitude of the intermolecular forces, and on the deformation conditions.

Card : 1/1

Category : USSR/Atomic and Molecular Physics - Physics of High-Molecular Substances.

D-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6450

Author : Lipatov, Yu.S., Kargin, V.A., Slonimskiy, G.L.

Inst : Physical Institute imeni L.Ye. Karpov, Moscow.

Title : Investigation of the Orientation in High Polymers. II. Crystalline Polymers.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 6, 1202-1206

Abstract : The heats of dissolution of oriented and non-oriented polyethylene, caprone, gutta-percha, and a copolymer of vinyl chloride and chlorvinylethane have been determined. It is shown that there is no substantial change in the ratio of the amorphous and crystalline phases upon orientation. It is suggested that the processes of cold drawing of crystalline polymers has a kinetic character. Comparison of data on crystalline and amorphous polymers leads to the conclusion that the kinetic character of the establishment of equilibrium in the system upon orientation is common to both groups

Card : 1/2

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6450

Lipatov, Yu. S.
USSR / Chemistry of High Molecular Compounds.

Abs Jour : Ref. Zhur. - Khimiya, No.2, 1958, 6783. L.

Author : Lipatov, Yu.S.

Inst : Not given.

Title : Orientation of High Polymers and its Effect on the Physical
and Chemical Properties.

Orig Pub : Uspekhi Khimii, 1957, 26, No.7, 768-800.

Abstract : Review. Bibliography, 172 references.

Card : 1/1

Uspekhi Khimii, 1958, 34 p.
(Polymers) (MIRA 11:9)

LIPATOV, Yu. S.

AUTHORS:

Lipatov, Yu. S. , Kargin, V. A. , Slonimskiy, G. L. 76-1-19/32

TITLE:

An Investigation of Orientation in High Polymers (Issledovaniye oriyentatsii v vysokopolimerakh)
III. The Effect of Orientation on the Vitrification Temperature of Amorphous Polymers (III. Vliyaniye oriyentatsii na temperatury steklovaniya amorfnykh polimerov)

PERIODICAL:

Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 1, pp.130-134 (USSR)

ABSTRACT:

In order to determine in what respect the softening temperature of the orientated films varies in comparison to the non-orientated ones, the shrinkage temperatures of orientated and non-orientated polyethylene samples (for an examination of polymers of this class which data are insufficient and for the polymers, data samples of which no data are known) were investigated here. Under assumption that the effect of interior stresses upon the softening temperatures is analogous to the effect of the exterior stresses, the softening-(shrinkage-) temperatures of films with frozen-up interior stresses here were compared to the temperatures at the beginning of deformation of the non-orientated films under influence of stresses, which are according to their quantity near the interior stresses of the samples of orientated polymers. The heating of the orien-

Card 1/5

An Investigation of Orientation in High Polymers. III. The Effect of Orientation on the Vitrification Temperature of Amorphous Polymers

76-1-19/32

tated films at a given deformation (4-12 hours at 120°C) for the purpose of decrease of the interior stresses at the expense of the relaxation caused the increase of the softening temperature up to 98 - 100°C in the case of films, which were expanded up to the relative expansion of 2000-3000 % at a stress of the order of magnitude of 300-500 g/mm². It is shown that in the case of almost equal stresses the softening temperature of the non-orientated sample is essentially lower. If this temperature is extrapolated for the zero-value of the stress, a softening temperature of 85-90°C is obtained, the fact of which is in agreement with the data from other publications for polystyrene. The temperature for the softening of orientated polymethylmethacrylate amounted to 84-87°C, whilst that one of the isotropic sample showed 98°C. Thus, the softening temperatures of the orientated samples with great interior stresses coincide with those ones of the isotropic samples with very small stresses, whilst in polymethylmethacrylate such a phenomenon does not occur. Without doubt, this fact shows a different process during the vitrification of these polymers. The vitrification of the polymer is determined by two causes: 1.) Increase of the intermolecular interaction in the case of a temperature drop, and 2.) increase of the intra-molecular interaction. Both effects

Card 2/5

76-1-19/32

An Investigation of Orientation in High Polymers. III. The Effect of Orientation on the Vitrification Temperature of Amorphous Polymers

cause the loss of the mobility of the chains (reference 7). The fact that the softening temperature of the orientated films of polystyrene is essentially higher than that of the non-orientated films, (on occasion of equal exterior stresses), shows that the relaxation processes in orientated polystyrene are frozen up. Simultaneously, the decrease stated here of the packing-density of polystyrene on occasion of its orientation (reference 3), as well as the presence of interior stresses might promote a decrease of the vitrification temperature.

The data obtained here may be explained as follows: The polystyrene without polar groups, which show a strong interaction cannot be regarded as a polymer, the vitrification of which is determined by the formation of lasting intermolecular bonds. High interior stresses cause a decrease of the softening temperature. This decrease is the greater, the greater the interior stresses (reference 4). Thus, the softening temperature of an orientated sample must be lower than it is in the case of a sample being not exposed to the influence of forces and which is non-orientated. Nevertheless, these temperatures coincide in the experimental range. This can

Card 3/5

75-1-19/32

An Investigation of Orientation in High Polymers. III. The Effect of Orientation on the Vitrification Temperature of Amorphous Polymers

only be connected with the fact that the straightening of the chain (which is the case on the occasion of an orientation) renders the transition of the chain from one configuration to the other more difficult, however, which is equivalent to an increase of the vitrification temperature. In the present case the softening temperature of an orientated polystyrene is determined by 1) the interior stresses decreasing the softening temperature, and 2) by the phenomenon of mechanic vitrification. Both effects possibly compensate one another to an arbitrary degree. The decrease of the interior stresses at the expense of their relaxation causes the fact that the temperature for the softening of the orientated sample will be higher, than of a non-orientated one.

No coincidence of the softening temperatures of orientated samples with high stresses with those ones of the non-orientated sample exists in the case of polymethylmethacrylate. This corresponds to the conception given here on the loosening of structure of polymethylmethacrylate in the case of an orientation. There are 1 table, and 7 references, 4 of which are Slavic.

Card 4/5

76-1-10/32
An Investigation of Orientation in High Polymers. III. The Effect of Orientation
on the Vitrification Temperature of Amorphous Polymers

ASSOCIATION: Physical-Chemical Institut imeni L. Ya. Karpov, Moscow
(Fiziko-khimicheskiy institut im. L. Ya. Karpova. Moskva)

SUBMITTED: October 22, 1956

AVAILABLE: Library of Congress

dated 5/75

AUTHORS: Kargin, V. A. , Lipatov, Yu. S.

76-32-2-14/38

TITLE: Investigation of the Orientation in High Polymers (Issledovaniye oriyentatsii v vysokopolimerakh) IV. The Influence of the Cooling-Down Velocity on the Packing Density of Polymer Glasses Within the Range of Vitrification Temperature (IV. Vliyaniye skorosti okhlazhdeniya v intervale temperatury steklovaniya na plotnost' upakovki polimernykh stekol)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 2, pp.326-331 (USSR)

ABSTRACT: In order to find out, to what degree the conditions of cooling-down in the case of polymers can influence the changes of the density of packing, experiments were carried out in order to investigate the sorption of low-molecular substances and to determine the heat of decomposition of differently treated polymers. The sorption measurements were carried out by means of Mac Ben (Mak-Ben) (?) spring scales. The decomposition heat was determined by means of an analogous adiabatic calo-

Card 1/3

Fig. 1. Dependence of the density of packing on the temperature of vitrification.

rimeter described by S. M. Skuratov (Reference 10). Polymethylmethacrylate and polystyrene were the objects of investigation. Data for hardened annealed, orientated and not orientated samples were given. The sorption data show that by means of hardening, a structure with essentially greater porosity can be obtained compared with slowly cooled samples. The porosity of the polymer in consequence of hardening can essentially exceed that caused by orientation. It is shown that the modification of the decomposition heat-effects in the case of orientation are greater than those with hardened and annealed samples. It is shown that the changes of the density of packing which were observed in dependence of the variations of the cooling velocity of the polymer at a temperature exceeding the vitrification temperature, are remarkably smaller than the modifications of the density of packing observed in orientation. Thus the influence of the cooling velocity of an orientated polymer on the density of its packing is at any rate smaller than is the influence of the actual deformation conditions. The data obtained show that the packing densities are different in slowly and quickly cooled poly-

Card 2/3

76-32-2-14/38

Investigation of the Orientation in High Polymers. IV. The Influence of the Cooling-Down Velocity on the Packing Density of Polymer Glasses Within the Range of Vitrification Temperature

methacrylate. These differences are, however, of the same order of magnitude as those in high-molecular polymers. It is further shown that the processes of thermal relaxation proceed essentially faster in orientated polymers than those of the volume relaxation in not orientated polymers. The quick termination of the volume relaxation process causes the difficulty of obtaining structures with greatly different densities of packing in polymers. A great difference in the densities of packing in polymers can only be obtained by means of very strong chains as is the case with silicic acid. There are 2 figures, 4 tables, and 16 references, 11 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva
(Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: November 22, 1956

Card 3/3

1. Polymers--Thermodynamic properties 2. Polymers--Chemical reactions

~~LIPATOV, Y. S.~~; ZUBOV, P. I.

Effect of temperature on the viscosity of concentrated solutions
of polymethacrylic acid and its salts. Vysokom.sped. 1 no.1:
88-93 Ja '59. (MIRA 12:9)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova.
(Methacrylic acid)

LIPATOV, Yu.S.; ZUBOV, P.I.; ANDRYUSHCHENKO, Ye.A.

Study of the effect of temperature on the turbidity of concentrated polymethacrylic acid solutions. Vysokom. soed. 1 no.3:425-431 Mr '59.
(MIRA 12:10)

1. Fiziko-khimicheskiy institut im. L. Ya. Karpova.
(Methacrylic acid) (Turbidity)

LIPATOV, Yu.S.; ZUBOV, P.I.

Structure formation in concentrated solutions of polymethacrylic acid.
Vysokom. soed. 1 no.3:432-437 Mr '59. (MIRA 12:10)

1.Fiziko-khimicheskiy institut im. L. Ya. Karpova.
(Methacrylic acid)

LIPATOV, Yu.S.; ZUBOV, P.I.

Gelation of methanol solutions of polymethacrylic acid. Vysokom.
soed. 1 no.5:711-714 My '59. (MIRA 12:10)

1. Fiziko-khimicheskiy institut im.L.Ya.Karpova.
(methacrylic acid) (Gelation)

LIPATOV, Yu.S.; ZUBOV, P.I.

Viscosity of concentrated solutions of styrene - methacrylic
acid copolymers. Vysokom.soed. 1 no.11:1655-1658 N '59.
(MIRA 13:5)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova.
(Styrene) (Methacrylic acid) (Polymers)

5.3830

88542
S/190/60/002/010/017/026
B004/B054

AUTHORS: Lipatov, Yu. S. and Pavlyuchenko, G. M.

TITLE: Investigation of the Interaction of Polymers With Fillers..
I. Variation of Properties of Some Polymers Attached to a
Glass Surface

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10,
pp. 1564-1568

TEXT: The authors start from the assumption that the adhesion of the polymer to a filler affects its properties. They examined this by measuring the swelling of gelatin and polystyrene applied to alkali-free glass fiber (diameter 7 μ). The ratio between glass fiber and organic substance was 1 : 1. The swelling of gelatin in water, of polystyrene in 30 vol% of toluene and 70 vol% of methanol was measured by a swelling-measuring instrument according to Dogadkin. Fig. 1 compares the swelling of free gelatin with that of gelatin adsorbed on glass fiber. Due to the intensive adhesion of gelatin to glass, the equilibrium swelling is 60% lower in the latter case. In polystyrene, however, double the swelling was observed on glass fiber as compared with free polystyrene film (Fig. 2). Therefrom, Card 1/2

Investigation of the Interaction of Polymers With Fillers. I. Variation of Properties of Some Polymers Attached to a Glass Surface

88542
S/190/60/002/010/017/026
B004/B054

the authors conclude that the packing of molecules was loosened in this case. Fig. 3 shows that the dilatometric determination of the vitrification temperature T_v , in fact, yielded 72.4°C for polystyrene on glass fiber as compared with 80.4°C for free polystyrene. An increase in the polystyrene packing by addition of 15% dimethyl phthalate as a plasticizer confirmed this effect, and yielded the same T_v of 56.8°C both on glass fiber and for free polystyrene. Thus, the properties of polymers applied to solids are strongly influenced by the interaction of their molecular chains with the filler. The authors mention papers by A. K. Burov and G. D. Andreyevskaya; A. L. Rabinovich; V. A. Kargin, M. B. Konstantinopolskaya, and Z. Ya. Berestneva; P. V. Kozlov and B. N. Korostylev; Yu. S. Lazurkin. They thank G. A. Kovtunencko for the supply of glass fiber, and V. A. Kargin and P. V. Kozlov for their discussions. There are 3 figures and 11 references: 10 Soviet and 1 US.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR
(Institute of General and Inorganic Chemistry of the AS BSSR)

SUBMITTED: June 6, 1960

Card 2/2

88543

5.3830

S/190/60/002/010/018/026
B004/B054

AUTHORS: Lipatov, Yu. S., Sergeyeva, L. M., and Maksimova, V. P.
TITLE: Investigation of the Interaction of Polymers With Fillers.
II. Adsorption of Polymers From Solutions on Glass Fiber
PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10,
pp. 1569-1574

TEXT: The authors studied the adsorption of polystyrene and polymethyl methacrylate from solutions of up to 3% on glass fiber (diameter 7 μ). The adsorption experiments were carried out with polystyrene dissolved in the good solvent benzene or in the poor solvent cyclohexanone, as well as with polymethyl methacrylate dissolved in acetone or in toluene. The intrinsic viscosities of the initial solutions are given in Table 2. The decrease in concentration due to adsorption at 25, 40, and 60°C was determined by means of an FM-56 (FM-56) nephelometer. Fig. 1 shows the course of adsorption at these temperatures for polystyrene in benzene; Table 1 gives the data for polystyrene in benzene at 25°C. Fig. 3 shows the adsorption of polystyrene from cyclohexanone solution at 40 and 60°C; no adsorption occurred at 25°C. Fig. 2 shows the adsorption of polymethyl
Card 1/2

Investigation of the Interaction of Polymers
With Fillers. II. Adsorption of Polymers
From Solutions on Glass Fiber

88543
S/190/60/002/010/018/026
B004/B054

methacrylic acid from acetone. Dissolved in toluene, this polymer showed no adsorption. In contrast with diluted solutions, not individual macromolecules are adsorbed from concentrated solutions, but their secondary associations existing in concentrated solutions. The authors mention papers by T. V. Dorokhina, A. S. Novikov, and P. I. Zubov; V. A. Kargin, M. B. Konstantinopol'skaya, and Z. Ya. Berestneva. They thank G. A. Kovtunenکو for a prescription specifying the treatment of glass fiber, and V. A. Kargin for his discussion. There are 3 figures, 2 tables, and 8 references: 4 Soviet, 2 US, and 2 German.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR
(Institute of General and Inorganic Chemistry of the AS BSSR)

SUBMITTED: June 6, 1960

Card 2/2

89585

S/190/61/003/002/003/012
B130/B202

15-8101

AUTHORS: Lipatova, T. E., Lipatov, Yu. S., Tutayeva, N. L.

TITLE: Effect of the grafting of polystyrene on the properties of orientated polyethylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 2, 1961, 184-190

TEXT: The authors attempted to modify the polyethylene properties by means of grafting. The polyethylene film washed in benzene and dried in the vacuum was orientated by elongation to 435-460% of its initial length. The elongated film was 0.004-0.0044 cm thick. The purified inhibited freshly distilled styrene was grafted in the vacuum (10^{-3} mm Hg) in a quartz ampoule at 25°C under the ultraviolet light of a TPK-2 (PRK-2) lamp according to a method by G. Oster (Ref. 9 see below). Benzophenone (3% solution in benzene) was used as sensitizer. Before grafting the films were immersed into the benzene solution for 15 minutes. Subsequently, benzene was evaporated in the vacuum. Birefringence of the dry film was by 5% less than before treatment. To avoid the homopolymerization of styrene, first the film was exposed, and then styrene was added in the vacuum. The authors studied the

Card 1/2

89585

S/190/61/003/002/003/012
B130/B202

Effect of the grafting ...

birefringence of the grafted specimens by means of the ~~TKC~~-56 (PKS-56) polariscope polarimeter as well as the temperature dependence of shrinkage. Birefringence has a maximum in the case of 7% polystyrene, it is strongly reduced at 9.2%, and begins to increase again at 12.3% to attain a maximum at 18.3%. Grafting inhibits shrinkage of polyethylene on heating. The present studies and the changes of Δn as depending on the polystyrene added indicate that grafting takes place in the submicroscopic cavities formed due to shrinkage. V. A. Kargin is mentioned. There are 6 figures, 1 table, and 13 references: 9 Soviet-bloc and 4 non-Soviet-bloc. The reference to English language publication reads as follows: G. Oster, H. Moroson, J. Polymer Sci., 34, 4/9, 1959.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR (Institute of General and Inorganic Chemistry, AS BSSR)

SUBMITTED: June 14, 1960

Card 2/2

LIPATOVA, T.E.; SKOPYNINA, I.S.; LIPATOV, Yu.S.

Polymerization of styrene in the presence of the glass fiber treated
by titanium tetrachloride. Vysokom.soed. 3 no.12:1877 D '61.
(MIRA 15:3)

(Styrene) (Polymerization) (Glass fibers)

LIPATOV, Yu.S.

Reaction of polymers and solid surfaces. Dokl. AN BSSR 5
no. 2:69-72 F '61. (MIRA 14:2)

1. Institut obshchey i neorganicheskoy khimii AN BSSR
Predstavleno akademikom AN BSSR M.M. Pavlyuchenko.
" (Reinforced plastics)

S/074/61/030/004/001/001
B117/B206

AUTHORS: Lipatov, Yu. S., N. F. Proshlyakova, N. F.

TITLE: Modern concepts on gel formation in polymer solutions and on the structure of gels

PERIODICAL: Uspekhi khimii, v. 30, no. 4, 1961, 517-531

TEXT: The authors deal with studies in the field of gel investigation. It was the aim of this paper to study the modern concepts on gel-formation processes in polymer solutions. The authors did not deal in detail with gels developed by swelling of a polymer in any solvent, but restricted themselves to those gels which are produced by gelatinizing of a solution. With regard to the basic conditions of gel formation, the authors came to the following conclusion based on existing data: gel formation only takes place in the case of a reduced solubility of the polymer in the solution. For this reason, all factors affecting the solubility of the polymer have an effect on the process of gel formation. However, gel formation cannot be ascribed only to the loss of solubility. The formation of a continuous net-

Card 1/6

S/074/61/030/004/001/001
B117/B206

Modern concepts on ...

work of macromolecules reacting with one another is necessary for gel formation. In this case, gel formation takes place at reduced solubility, but not the deposition of a precipitate. Every addition to the solution of admixtures which favor the formation of intermolecular bonds, promotes gel formation. Finally the capability of gel formation is also in correlation with the chain structure of the polymer molecule. This is a definite premise for the setup of the network. On the basis of research results in the field of gel formation the authors have drawn the following conclusions: The non-equilibrium gel is a two-phase system while the equilibrium gel is a thermodynamically stable two-component one-phase system. The development of non-equilibrium gelatins is accompanied by a certain change of thermodynamic quantities which characterize the system. The possibility to apply for gels a number of thermodynamic correlations describing the phase transitions is no reason for considering the melting of gelatins as a transition of first order which is accompanied by a strong change of the order of the system and characterized by quite specific thermodynamic parameters. The mechanism of gel formation in polymer solutions is described by the authors in the following way, based on modern conceptions: the process of gel for-

Card 2/6

S/074/61/030/004/001/001
B117/B206

Modern concepts on ...

mation consists in solid intermolecular bonds being formed of localized (e. g. hydrogen bonds) as well as non-localized type (e. g. Van der Waals' bonds). It is not the interaction of individual molecular chains, but the interaction of secondary formations contained in concentrated solutions, molecule aggregates or molecular chain packages, that is of great importance in the formation of the network. Modern conceptions on the structure of amorphous polymers and the structure of gels permit the conclusion that the molecule distribution in gels is sufficiently ordered. This order is due to the fact that stable secondary formations, such as molecule aggregates and packages, are present in solutions with a certain degree of order. This order must, however, not be compared with the order characteristic of crystalline polymers. The modern conceptions on the nature of gels are confirmed by existing data on their mechanical properties. Generally, the mechanical properties of polymeric gels are similar to those of cross-linked polymers. They are determined by the change of form of chain sections during deformation, viz. they have a rubber-like elasticity. The analogy between gels and networks of cross-linked polymers gives a picture of the effect of the number of cross-links in the network on the mechanical properties of gels. Polymeric gels can show real elastic deformations, i. e.,

Card 3/6

S/074/61/030/004/001/001
B117/B206

Modern concepts on ...

they are subject to Hooke's law up to fusing temperature. The existence of elastic properties permits the characterization of gels according to the value of the modulus of hardness. The admixtures affecting the gelatinizing process have also a considerable effect on the mechanical properties of gels. The most interesting peculiarity of the mechanical properties of gels is their relaxation behavior. Relaxation shows a strongly different character in diluted and concentrated gels. Diluted gels are subject to Hooke's law over a wide range of deformation rates, the amount of deformation being not dependent on the duration of the action of force. For concentrated gels, however, the amounts of deformations depend the more on the rate of the action of force, the higher the concentration. In this case, Hooke's law is not maintained any more. The relaxation properties of gels depend to a high degree on their production methods. A further peculiarity of the relaxation behavior of gels is the fact that their hardness remains unchanged during relaxation, viz., the total number of bonds does not change. Two peculiarities of the mechanical properties of gels are pointed out in conclusion: 1) the presence of reversible elastic deformations and their dependence on the conditions of formation of the gels; 2) relaxation prop-

Card 4/6

S/074/61/030/004/001/001
B117/B206

Modern concepts on ...

erties of gels which depend on their concentration. Although many problems of the study of gels are not yet solved, it is already possible to obtain a somewhat clear picture of the structure and properties of gels. The following Soviet authors are mentioned: V. A. Kargin, S. P. Papkov, Z. A. Rogovin (Ref. 5: ZhFKh, v. 10, 607 (1937); v. 13, 206, (1939)); S. M. Lipatov (Ref. 8: Dokl. na Vses. Konf. po Koll. khimii, Tbilisi, izd. AN SSSR, 1958; Ref. 9: Fiziko-khimiya kolloidov, (Physical Chemistry of Colloids), Goskhimizdat, 1948); P. I. Zubov, Z. N. Zhurkina, V. A. Kargin (Ref. 14: Koll. zh. v. 9, 109 (1947); Ref. 15: Koll.zh., v. 9, 367 (1947)); P. I. Zubov (Ref. 16: Doktorskaya dissertatsiya, (Doctor's dissertation) Fiz-khim. in-t im. L. Ya. Karpova, 1948); S. M. Lipatov, S. M. Fel'dman (Ref. 27: Koll. zh. v. 3, 703 (1937); v. 6, 806 (1940)); S. I. Meyerson, S. M. Lipatov (Ref. 28: Koll. zh. v. 17, 230 (1955); S. P. Papkov (Ref. 41: Koll.zh. v. 19, 333 (1957)); V. I. Sharkov, R. K. Boyarskaya (Ref. 42: DAN, v. 108, 99 (1956)); S. M. Lipatov, P. M. Lapin (Ref. 45: Koll. zh., v. 3, 723 (1937)); V. A. Kargin, N. F. Bakeyev (Ref. 50: Koll. zh., v. 19, 1933 (1957)); V. A. Kargin, G. L. Slonimskiy (Ref. 51: ZhFKh, v. 15, 1022 (1941)); (Ref. 52: Usp. khimii, v. 24, 785 (1955)); P. I. Zubov, Z. N. Zhurkina, V. A. Kargin

Card 5/6

Modern concepts on ...

S/074/61/030/004/001/001
B117/B206

(Ref. 54: Koll.zh., v. 16, 109 (1954)); V. A. Kargin, G. L. Slonimskiy, A. I. Kitaygorodskiy (Ref. 57: Koll. zh., v. 19, 120 (1957)); V. A. Kargin, N. F. Bakeyev, Kh. Vergin (Ref. 58: DAN, v. 122, 97 (1958)); L. V. Ivanova-Chumakova, P. A. Rebinder (Ref. 66: Koll. zh., v. 18, 683 (1956)).

The four most recent references to English-language publications read as follows: Ref. 32: I. Eldridge, I. Ferry, J. Phys. Chem., v. 58, 992 (1954); Ref. 36: H. Boedtker, P. Doty, H. Phys. Chem., v. 58, 968 (1954); Ref. 37: P. Flory, R. Garnett, J. Am. Chem. Soc., 80, 4836 (1958); Ref. 56: I. Bello, H. Riese, I. Vinograd, J. Phys. Chem., v. 60, 1299 (1956). There are 71 references: 36 Soviet-bloc and 35 non-Soviet-bloc. ✓

ASSOCIATION: Fiziko-khimicheskii institut im. L.Ya. Karpova (Physicochemical Institute imeni L. Ya. Karpov)

Card 6/6

9/020/61/141/002/017/027
B101/B147

AUTHORS: Zubov, P. I., Lipatov, Yu. S., and Kanavskaya, Ye. A.

TITLE: Dependence of the conformation of a polymer chain in solution on the concentration of the latter

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 2, 1961, 387-388

TEXT: In previous papers (Vysokomol. soyed., 1, 432 (1959)); (Koll. zhurn., 21, 598 (1960)), the authors found that on transition from dilute to concentrated solutions of polymethacrylic acid the temperature coefficient of viscosity changes its sign. The present paper deals with this effect which is due to changes of conformation of the chain. The viscosity of aqueous solutions of polymethacrylic acid (molecular weight 330,000) with concentrations of 6.9 and 12% was measured at 20-65°C as a function of shear stress. A rotating viscosimeter of the Shvedov type was used for the purpose. Results are given in Fig. 1. This negative thixotropy is explained by coiling up of chains under the effect of shear stress. This effect has an upper and a lower temperature limit. The upper limit is the temperature of gel formation above which the chains cannot coil up any

Card 1/8 2

S/O20/61/141/002/017/027
B101/B147

Dependence of the conformation ...

longer. Gel formation can be explained by the fact that in coiled-up chains more COOH groups can react with each other. Thus, the conformation of polymer molecules in solution depends on the type of solvent and on the temperature and concentration of the solution. A paper by N. F. Bakeyev, V. S. Pshezhetskiy, and V. A. Kargin (Vysokomol. soyed., 1, 1812 (1959)) is referred to. There are 1 figure and 10 references: 8 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: J. Elliassaf, A. Silberberg, A. Katchalsky, Nature, 25, 53 (1957).

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of Academy of Sciences USSR)

PRESENTED: June 20, 1961, by V. A. Kargin, Academician

SUBMITTED: June 12, 1961

Card 2/02

15-8350 2209

32346
S/190/62/004/001/007/020
B101/B110

AUTHORS: Lipatov, Yu. S., Khoroshko, R. P.

TITLE: Study of interaction of polymers with fillers. III. Thermo-
mechanical properties of polystyrene filled with glass fiber

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 1, 1962, 37-41

TEXT: The change of thermomechanical properties of polystyrene with glass fiber additions was studied. Films without additions, and with a 30 or 60% content of glass fibers 0.1-2 mm long and 7 μ in diameter, were produced from a 3% benzene solution of commercial emulsion polystyrene. Films without filler were 0.2 mm, with filler 0.4-0.6 mm thick depending on their filler content. Thermomechanical curves were recorded with an apparatus by Yu. S. Lipatov, V. A. Kargin, and G. L. Slonimskiy (Zh. fiz. khimii, 32, 131, 1958). Samples ~20 mm long were electrically heated in a glass cylinder (rate 0.5°C/min), and the elongation was measured with a KM-6 (KM-6) cathetometer. From the curves, the softening point T_s was determined as being the point of intersection of the tangents at the two almost linear curve sections. The linear dependence of T_s on the load

Card 1/2

32346
S/190/62/004/001/007/020
B101/B110

Study of interaction of ...

(2-10 kg/cm²) and filler content allowed the determination of T_{s_0} at zero tension. The activation energy E_d of deformation was calculated from the dependence of the logarithm of deformation rate on $1/T$. The following data were found: nonfilled polystyrene: $T_{s_0} = 106.5^\circ\text{C}$, $E_d = 125$ kcal/mole at 3 kg/cm²; 132 kcal/mole at 6 kg/cm²; 30% filled polystyrene: $T_{s_0} = 116^\circ\text{C}$; 60% filled polystyrene: $T_{s_0} = 126^\circ\text{C}$. E_d of filled samples was 77 kcal/mole at 3 kg/cm², 84 kcal/mole at 6 kg/cm². Hence, it is concluded that the behavior of filled polymers is affected by the interaction of molecular packets with the filler surface on the one hand, and by a structural change of the packets contacting the filler. A. V. Sidorovich, V. S. Vashchenko, Ye. V. Kuvshinskiy, and T. I. Sogolova are mentioned. V. A. Kargin is thanked for a discussion. There are 5 figures, 1 table, and 8 Soviet references.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR
(Institute of General and Inorganic Chemistry AS BSSR)

SUBMITTED: January 21, 1961
Card 2/2

S/190/62/004/004/016/019
B117/B138

537-00
5.1/05
AUTHORS:

Lipatov, Yu. S., Peryshkina, N. G., Sergeyeva, L. M., Vasilenko, Ya. P.

TITLE:

The interaction of polymers with fillers. IV. Adsorption of gelatin, polymethacrylic acid and their copolymers by glass fibers from solutions

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 4, 1962, 596-600

TEXT: The adsorption of edible gelatin and polymethacrylic acid from aqueous solutions, as well as of the copolymers of styrene and methacrylic acid from solutions in organic solvents, was studied with glass fibers at 30°C. It was intended to clarify the effect of the nature of solvent on adsorption and to check previous conjectures. In the concentration range with noticeable structure formation of the gelatin (0.2%), the adsorption of gelatin from aqueous solutions was found to reach a diffuse maximum and to disappear at a concentration of 0.4%. This confirms previous assumptions (Ref. 2: Yu. S. Lipatov, Dokl. AN BSSR, 55, 69, 1961) that the transition of molecular aggregates to the surface becomes more difficult with progressive

Card 1/3

S/190/62/004/004/016/019
B117/B138

The interaction of polymers...

structure formation. For solutions in urea, which prevents structure formation of gelatin, a slighter adsorption and a lower maximum, shifted towards higher concentrations, were ascertained. No adsorption was found in the case of polymethacrylic acid, owing to globular coiling of molecules. During partial neutralization (5-50%) of the acid, which causes uncoiling of the chain, the adsorption values found did not exceed the measurement errors. Copolymer with a low number of methacrylic acid links (1.6%) was adsorbed from benzene solution, but not from cyclohexanone, which confirmed the theory of the effect of the solvent quality on adsorption. In the concentration range of 0.1 - 2%, copolymer with 24% methacrylic acid links was not adsorbed from any of the solvents used (dioxane, acetone/benzene mixture). Beside the chemical nature of the polymer, the form of its chains and degree of structure formation, other factors must also be considered during the adsorption of water-soluble polymers from aqueous solutions: strong blocking of gelatin molecules (owing to reaction with water), strong intramolecular bonding of carboxyl groups (in the case of polymethacrylic acid) and the interaction between solvent (water) and the surface of the adsorbent. Conclusion: The following main factors affect adsorption of polymers from solutions: (1) shape of the macromolecule; (2) degree of intermolecular

Card 2/3

The interaction of polymers...

S/190/62/004/004/016/019
B117/B138

interaction in solutions; (3) nature of the solvent. The latter determines the degree of molecular interaction and is able to block active groups of the polymer or the surface of the adsorbent. There are 1 figure and 2 tables. The two English-language references are: N. Widerhorn, A. R. Brown, J. Polymer Sci. 8, 651, 1952; P. Graham, M. Glackman, J. Polymer Sci., 38, 417, 1959.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR (Institute of General and Inorganic Chemistry AS BSSR)

SUBMITTED: March 24, 1961

Card 3/3

LIPATOVA, T.E.; BUDNIKOVA, V.A.; LIPATOV, Yu.S.

Interaction of polymers with fillers. Part 5: Effect
of the conditions of depositing a polymer on glass fiber
and the method of treating the glass fiber on the properties
of the polymer. Vysokem.sped. 4 no.9:1398-1403 S '62.
(MIRA 15:11)

1. Institut obshchey i neorganicheskoy khimii AN
Belorusskoy SSR.

(Glass fibers)

S/250/62/006/001/002/002
1001/1201

AUTHOR: Lipatov, Yu. S., Perushkina, N. G., Vasilenko, Ya. P., and Sergeeva, L. M.

TITLE: The adhesion of polymers to a solid surface and their adsorption from solutions

PERIODICAL: Akademia nauk Belaruskay. Doklady, v. 6, no. 1, 1962, 42-44

TEXT: Gelatine water solutions and copolymers of styrene with methacrylic acid in organic solvents on—the surface of glassfiber—were investigated by a method similar to that described in a previous paper (Ref. 6, Yu. S. Lipatov, L. M. Sergeeva, V. P. Maksimova, Vysikomoleksoyed., 2, 1570, 1960). The concentration was determined by means of a spectrometer CФ-4 (SF-4) with precision up to 0.001%. The copolymer solutions was determined by means of a nephelometer ФМ-56 (FM-56) with exactness up to 0.01%. Adsorption of copolymers with distribution of 1.6% and 24% of methacrylic acid was investigated. In cases of gelatine in water solution the adsorption is low, but it attains a maximum, (see Ref. 2, Yu. S. Lipatov, DAN BSSR, v. 5, 69, 1961). Adsorption of a copolymer with a distribution of 1.6% of methacrylic acid approaches the adsorption of pure polystyrene. In the case of 24% of methacrylic acid there is no adsorption from solvents of the copolymer. Comparison of the adsorption and adhesion shows that there is no direct link between adhesion of the polymer and its adsorption in spite of their dependence on the interaction between functional groups in the polymers molecule's form and the surface groups. There are different conditions for adsorption from

Card 1/2

The adhesion of...

S/250/62/006/001/002/002
I001/I201

solutions and formation of strong adhesion bonds. There is a competition for active points on the surface among the molecules of the polymer and the solvent, that lessens the adsorption of the polymer. There are 2 tables. English-language references read as follows: 1) E. Gilliland, E. Gutoff, J. Phys. Chem., 64, 407, 1960; 2) J. Rutzler, Adhesive Age, 2, 39, 1952. ✓

ASSOCIATION: Institute Obshchey i neorganicheskoy Khimii AN BSSR (Institute of General and Inorganic Chemistry AS BSSR).

PRESENTED: M. M. Pavlychenko, Academician of AS BSSR).

SUBMITTED: April 7, 1961

Card 2/2

36916
S/020/62/143/005/015/018
B101/B110

5.3832
15.8500 (4109)
AUTHOR: Lipatov, Yu. S.

TITLE: Plasticizing of filled polymers

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 5, 1962,
1142-1144

TEXT: The vitrification temperature T_v , of polystyrene and polymethyl methacrylate films which were filled with 50% by weight of glass powder was determined. Dimethyl phthalate was added as plasticizer (P). The vitrification temperature was determined dilatometrically according to L. Marker, R. Early (J. Polymer Sci., 38, 369 (1959)). It has been found that the filling increases T_v (e.g., non-filled polystyrene, $T_v = 84^\circ\text{C}$, filled polystyrene, $T_v = 108^\circ\text{C}$). An addition of P reduced T_v more intensively with filled samples (e.g. for 7% by volume of P and non-filled polystyrene $T_v = \sim 70^\circ\text{C}$, for filled polystyrene $T_v = \sim 72^\circ\text{C}$).

Card 1/2

Plasticizing of filled polymers

S/020/62/143/005/015/018
B101/B110

This effect was explained as follows: (1) the increase in T_v on filling is due to the fact that the motion of the molecular packets is rendered more difficult owing to the adsorption on the filler surface and steric hindrance; (2) the plasticizing of filled polymers is based on two effects: (a) interpacket plasticizing by separation of the bonds polymer - filler surface; (b) normal plasticizing by separation of the polymer - polymer bonds. The mechanical properties of polymers can be varied in a wide range by selecting adequate fillers and plasticizers. There are 2 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk BSSR (Institute of General and Inorganic Chemistry of the Academy of Sciences BSSR)

PRESENTED: December 9, 1961, by V. A. Kargin, Academician

SUBMITTED: December 9, 1961

Card 2/2

ACCESSION NR: AR 4042251

S/0081/64/000/008/S021/S021

SOURCE: Ref. zh. Khimiya, Abs. 8S107

AUTHOR: Lipatov, Yu. S.; Pery*shkina, N. G.

TITLE: Influence of small quantities of filler on thermomechanical properties of polystyrene

CITED SOURCE: Sb. Vy*sokomolekul. soyedineniya. Adgeziya polimerov. M., AN SSSR, 1963, 45-51

TOPIC TAGS: polystyrene, thermomechanical property, fiberglass filler, filler

TRANSLATION: The thermomechanical properties of polystyrene containing different quantities (2, 5, 10 and 20 wt%) of fiberglass filler are investigated. It was determined that the introduction of even small quantities of filler leads to a change of the entire form of the thermomechanical curve and to expansion of the region of the independence of the magnitude of deformation from temperature. These results

Card 1/2

ACCESSION NR: AR4042251

are explained by the cross-linking action of filler particles. From data on the kinetics of development of a deformation at constant temperatures and data on the reduction of deformation after removal of loads, the magnitude of highly elastic and viscofluid deformation, depending upon content of filler, are determined. Both deformations decrease with introduction of filler. The modulus of highly elastic deformation increases with the growth of filler content, but this growth is less noticeable at higher temperatures; this is connected with the disintegration of bonds between surface of polymer and filler occurring with an increase in temperature. It is shown that in the filled polymer the speed of the relaxation processes is sharply lowered, which is connected with the limitation of mobility of chains owing to their interaction with the surface of the filler. Some hypotheses about mechanism of deformation of filled polymer are given, and the conclusion is made that the noticeable influence rendered by even small quantities of the introduced filler is connected with the fact that in the formation of the structural lattice of the filled polymer there participate not separate molecules in direct contact with the surface, but secondary molecular structures.

SUB CODE: OC, MT

ENCL: 00

Card 2/2

ACCESSION NR: AR4042250

S/0081/64/000/008/S020/S021

SOURCE: Ref. zh. Khimiya, Abs. 8S106

AUTHOR: Lipatov, Yu. S.; Peryshkina, N. G.

TITLE: Filling and plasticization of atactic and isotactic polystyrene

CITED SOURCE: Sb. Vysshomolekul. soyedineniya. Adgeziya polimerov. M., AN SSSR, 1963, 107-112

TOPIC TAGS: polystyrene, atactic polystyrene, isotactic polystyrene, plasticization, thermomechanical property, polymer, plasticizer, filler, fiberglass filler

TRANSLATION: Investigates the thermomechanical properties of atactic and isotactic crystalline and amorphous polystyrene, depending upon content of filler (fiberglass) and plasticizer (dimethyl phthalate). It was determined that the introduction of a filler has the greatest influence on the thermomechanical properties of atactic polystyrene and least effect on the properties of crystalline isotactic polystyrene.

Card 1/2

ACCESSION NR: AR4042250

Thus, the interaction of the polymer with the filler and the adhesion of the polymer to the filler surface essentially depend on the phase state of the polymer. Study of the influence of plasticization of filled polymers showed that with introduction of a plasticizer the lowering of temperature of fluidity appears in a significantly greater degree for filled polymers. The influence of the plasticizer also depends on the phase state of the polymer. The joint influence of filler and plasticizer is not additive. Research on the thermomechanical properties of amorphous isotactic polystyrene showed that the conditions of crystallization during heating should be excellent both in presence and in absence of filler and plasticizer. The data obtained also gave a basis to assume that change of deformability of polymers in the presence of a filler cannot be explained only by the growth of viscosity of the system with the introduction in it of the filler, but to a significant degree is determined by the presence of physical interactions of polymer molecules with the surface of particles of the filler, which are sufficiently strong even at temperatures of fluidity. From authors' abstract.

SUB CODE: OC, MT

ENCL: 00

Card 2/2

ACCESSION NR: AR4042243

S/0081/64/000/008/S006/S008

SOURCE: Ref. zh. Khimiya, Abs. 8S31

AUTHOR: Lipatov, Yu. S.

TITLE: Adsorption of polymers from solutions and its connection with adhesion of polymers to surfaces

CITED SOURCE: Sb. Vy*sokomolekul. soyedineniya. Adgeziya polimerov. M., AN SSSR, 1963, 117-122

TOPIC TAGS: polymer, adsorption, adhesion

TRANSLATION: Presents detailed research on influence of temperature and thermodynamic quality of solvent on adsorption by fiberglass of polymethylmethacrylate from solutions in a wide range of concentrations. It was determined that the character of the isotherms of adsorption essentially depends on the quality of the solvent and, consequently, on the form of the polymer chain in solution and conditions of secondary structure formation in solution. Under certain conditions adsorption

Card 1/2

ACCESSION NR: AR4042243

passes through a maximum, after which it drops to zero. This is explained by strong cross-linking of the solution, preventing transition of macromolecules to the surface of the adsorbent. The data obtained allow one to consider that during adsorption on surface of adsorbent there are transferred not isolated macromolecular coils, as in dilute solutions, but secondary structural formations, which appear in the solutions with an increase of concentration. Such presentations allow good explanation of the observed magnitudes of adsorption and the influence on adsorption of the temperature and nature of solvent. On the basis of analysis of a quantity of data on adsorption of polymers from solutions and data on the adhesion of polymers to the surface of glass, it is concluded that there is no direct connection between adsorbability of a polymer from solution and the adhesion of the same polymer to the surface of a filler. The absence of such a connection is explained by the different conditions of interaction of macromolecules with surface of filler in the presence of and in the absence of the solvent. From the author's abstract.

SUB CODE: OC, GC

ENCL: 00

Card

2/2

45401

S/190/63/005/002/023/024
B101/B102

15.8210

AUTHORS:

Lipatov, Yu. S., Lipatova, T. E., Vasilenko, Ya. P.,
Sergeyeva, L. M.

TITLE:

Study of the interaction between polymers and fillers.
VII. Glass transition point and packing density of
filled polystyrene and polymethyl-methacrylate

PERIODICAL:

Vysokomolekulyarnyye soyedineniya, v. 5, no. 2, 1963,
290-295

TEXT: Polystyrene (PS) and polymethyl methacrylate (PMMA) were filled with glass fibers 20-50 mm long, or cut to a length of 0.1-0.2 mm, or with powdered glass. Films were made of these and the glass transition point T_g was determined dilatometrically. PMMA had two T_g ; in nonfilled PMMA $T_{g_1} = 85.5^\circ\text{C}$, $T_{g_2} = 113^\circ\text{C}$. Results: T_g rose with increasing degree of filling. Moreover, the form of the filler was important. T_g increased, e.g., from 84°C for nonfilled PS to 94°C for 50% filling with short glass.

Card 1/3

Study of the interaction between ...

S/190/63/005/002/023/024
B101/B102

fiber, to 88°C with long glass fiber, to 108°C for powdered glass. In PMMA with 50% short glass fiber filling $T_{g1} = 110^{\circ}\text{C}$, $T_{g2} = 131.8^{\circ}\text{C}$. With higher degrees of filling, T_{g2} was no longer observed. T_{g1} increased linearly with the degree of filling, T_{g2} somewhat more slowly. The rise of T_g is explained by the mobility of the molecular bundles on the surface being limited by the formation of strong physical bonds. In PMMA the increase of T_g is steeper because of its better adhesion to the glass. With increasing degree of filling, the swelling of the films increased equally, i.e., in PS from 80% for nonfilled to 290% for 50%-filled, in PMMA from 220 to 310%. Hence it is concluded that the packing density decreases owing to the filling. In PS, T_g fell almost linearly with increasing content in plasticizer (dimethyl phthalate). This is due to the plasticizer inducing a hindrance to the formation of stronger bonds between the polymer molecules and the surface. With equal content of plasticizer, T_g falls more sharply with a higher degree of filling. Thus the properties of filled films of

Card 2/3

Study of the interaction between ...

B/190/63/005/002/023/024
B101/B102

rigid polymers differ from those of nonfilled films in having higher T_g and looser molecular packing. There are 5 figures and 2 tables.

ASSOCIATION:

Institut obshchey i neorganicheskoy khimii AN BSSR
(Institute of General and Inorganic Chemistry AS BSSR)

SUBMITTED:

September 30, 1961

Card 3/3

KANEVSKAYA, Ye.A.; LIPATOV, Yu.S.; ZUBOV, P.I.

Effect of addition agents on the structural viscosity of concentrated solutions of polymethacrylic acid. Vysokom.soed. 5 no.4:587-592
Ap . '63. (MIRA 16:5)

1. Institut fizicheskoy khimii AN SSSR i Institut obshchey i
neorganicheskoy khimii AN BSSR.
(Methacrylic acid) (Viscosity)

KANEVSKAYA, Ye.A.; ZUBOV, P.I.; IVANOVA, L.V.; LEPACHOV, Ya.S.

Temperature dependence of light scattering and viscosity of
polymethacrylic acid solutions. *Vysokom. soed.* 6 no.6:911-987
Je '64 (MIRA 18:2)

1. Institut fizicheskoy khimii AN SSSR.

ACCESSION NR: AP4040484

S/0190/64/006/006/1054/1059

AUTHOR: Lipatov, Yu. S.; Tsy*bul'ko, A. Ya.; Lipatova, T. E.

TITLE: Polymerization of an unsaturated ester of novolac resin

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 6, 1964, 1054-1059

TOPIC TAGS: phenol formaldehyde resin, novolac resin, modified novolac resin

ABSTRACT: A modified, unsaturated novolac resin which thermosets without curing agents has been prepared at the Institute of General and Inorganic Chemistry, Academy of Sciences, BSSR. Novolac resin 113-P-3 containing 13.36% OH groups was modified by esterification with methacryloyl chloride in pyridine to a degree of esterification of 52—56% as indicated by chemical analysis and IR spectroscopy. The modified resin solution polymerizes at 60C in the presence of benzoyl peroxide by the free-radical mechanism to form a still-unsaturated polymer. The modified resin also polymerizes with styrene and

Card 1/2

ACCESSION NR: AP4040484

acrylonitrile. Thermomechanical analysis and solubility tests showed that the polymers and copolymers thermoset at 120—160C to a product with a three-dimensional network structure. The modified resin also thermosets with the catalytic polymerization product of bis(triethylene glycol) phthalate methacrylate to a product with a three-dimensional network structure. Orig. art. has: 1 figure, 2 tables, and 1 formula.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR
(Institute of General and Inorganic Chemistry, AN BSSR)

SUBMITTED: 05Jul63

DATE ACQ: 06Jul64

ENCL: 00

SUB CODE: MT, GC

NO REF SOV: 005

OTHER: 001

Card 2/2

L 15327-65 ENT(m)/EPF(c)/EPR/EWP(j)/T Pc-L/Pr-L/Ps-L EPL/ASD(m)-3/AS(mp)-2
WW/RM

ACCESSION NR: AP4049150

S/0190/64/006/011/1969/1973

AUTHOR: Tutayeva, N. L.; Lipatova, T. E.; Lipatov, Yu. S. 15

TITLE: Effect of grafting linear and three-dimensional polymers on some properties of oriented polymers 7

SOURCE: Vysokomolekulyarnyye soedineniya, v. 6, no. 11, 1964, 1969-1973

TOPIC TAGS: oriented polymer, polymer viscose fiber, linear polymer grafting, three dimensional polymer grafting, polystyrene grafting, polyacrylate ester grafting, graft polymerization, grafted polymer property 7

ABSTRACT: The fact that polymer fibers have valuable properties prompted a study of the modification of these properties by the grafting of linear or three-dimensional polymers; it was expected that the grafted polymers could be used to create materials with new properties. Grafting of three-dimensional polyacrylate ester and of polystyrene onto viscose fiber (cord) was achieved by polymerization of the oligomer in dilute solution at the boiling point of the solvent (acetone),

Cord 1/2

L 15327-65

ACCESSION NR: AP4049150

2

and by polymerization of styrene at 50C in the presence of preliminary irradiated fiber. Measurements of the ultimate swelling in alkali and of the tensile strength of the grafted fibers showed that for low grafting values a sharp change in the properties takes place. Grafting of the three-dimensional polymer in the microcavities does not lead to further disturbance of the fiber structure, while grafting of polystyrene above a certain value disrupts the oriented structure of the viscose fiber. The increase in tensile strength of the fibers with grafted polyacrylate ester is explained in terms of the cross-linking of elementary fibers by means of three-dimensional grafted polymers. Certain general principles of grafting on oriented polymers were deduced on the basis of data from this and previous studies. Orig. art. has: 5 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR (Institute of General and Inorganic Chemistry, AN BSSR)

SUBMITTED: 06Jan64

ENCL: 00

SUB CODE: MT

NO REF SOV: 002

OTHER: 002

ATD PRESS: 3138

Card 2/2

LIPATOV, Yu.S.

Conformation of molecules of polymethacrylic acid in dilute aqueous solutions. Dokl. AN BSSR 8 no. 1:41-43 Ja '64.
(MIRA 17:5)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.
Predstavleno akademikom AN BSSR M.M.Pavlyuchenko.

TUTAYEVA, N.L.; LIPATOVA, T.E.; LIPATOV, Yu.S.

Grafting of polyacrylate on viscose fiber. Dokl. AN BSSR 8
no.2:108-110 F '64. (MIRA 17:8)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.
Predstavleno akademikom AN BSSR M.M. Pavl uchenko.

L 14349-65 EWP(e)/EWT(m)/EPF(c)/EPR/EWP(j)/EWP(b)/T Pc-4/Pq-4/Pr-4/ps-4 ASD(m)-3/
RPL WW/RM/WH
ACCESSION NR: AP4047008 S/0250/64/008/009/0590/0593

AUTHOR: Lipatov, Yu. S.; Sergeyeva, L. M.

TITLE: Effect of filler on structure formation in polymers 7 B

SOURCE: AN BSSR. Diklady*, v. 8, no. 9, 1964, 590-593

TOPIC TAGS: filler, polymer, structure, supramolecular structure, tailor made material, polystyrene, polymethyl methacrylate

ABSTRACT: The effect of fillers on the supramolecular structure of polymers has been studied with a view toward the preparation of tailor-made materials. Poly-styrene and poly(methyl methacrylate) containing various amounts of chopped glass fiber strand were used. Specimens were prepared by casting films from solutions and by compression molding at 185C. Changes in polymer structure, such as in the packing density of macromolecules and bundle- and globule-type supramolecular formations, were evaluated quantitatively by determining specific surface and porosity through inert-solvent sorption experiments and by thermodynamic computations. The following conclusions were drawn: 1) filler incorporation has a marked effect on structure formation in that it changes the arrangement of macromolecules and supramolecular formations; 2) even with a given amount of filler, structures having

Card 1/2

L 14349-65

ACCESSION NR: AP4047008

different properties can be produced by different processing methods; 3) quantities reflecting the mechanical properties of filled polymers can be correlated with those quantities which characterize structure and packing density. Changes in mechanical properties upon filler addition, however, are not due solely to the incorporation of the filler and the resultant formation of structures. Mechanical changes are also governed by property changes in the polymer proper as a result of molecule-filler surface interaction and changes in structure-formation conditions. Orig. art. has: 2 figures and 2 tables

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR (Institute of General and Inorganic Chemistry, AN BSSR)

SUBMITTED: 17Jan64

ENCL: 00

SUB CODE: GC, MT

NO REF SOV: 005

OTHER: 000

Card 2/2

LIPATOV, Yu.S., doktor khim.nauk

Reinforced plastics. Priroda 53 no. 12:50-54 '64.
(MIRA 18:1)

1. Institut ~~Obshchey~~ neorganicheskoy khimii AN BSSR, Minsk.

BEKTOV, A.; MIALEKO, A. Ye.; LI, MU, T. T.

Polymerization of unsaturated nitriles. Vysokom. mol. soed. 6
no. 6:1041-1059 (1964) (MIRA 1892)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.

TUTAYOVA, N.A.; LIPATOVA, T.M.; LIPATOV, Ya.S.

Effect of grafting of linear and three-dimensional polymers on
some properties of oriented polymers. Vysokom. soed. 6 no.11:
1969-1973 N 164 (MIRA 13:2)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.

L 22599-66 EWT(m)/EWP(j)/T/ETC(m)-6 LIP(n) WM/GS/IM

ACC NR: AT6006245

SOURCE CODE: UR/0000/65/000/000/0056/0063

AUTHOR: Lipatov, Yu. S. (Doctor of chemical sciences)

ORG: Institute of Chemistry of High Molecular Compounds AN UkrSSR, Kiev (Institut khimii vysokomolekulyarnykh soyedineniy AN UkrSSR)

TITLE: Some physicochemical aspects of the mechanism of reinforcing plastics by fillers

SOURCE: AN UkrSSR. Modifikatsiya svoystv polimerov i polimernykh materialov (Modification of the properties of polymers and polymeric materials). Kiev, Naukova dumka, 1965, 56-63

TOPIC TAGS: solid mechanical property, plastic strength, polymer, filler, plasticity

ABSTRACT: The mechanism of plastic-filler interaction (which results in improved mechanical properties of filled plastics) is discussed on the basis of data in the literature and the authors' previously published studies. The reinforcing function of fillers on plastic is explained in terms of the special orientation of polymer chains attached to the filler surface, the firmness of polymer adhesion to the filler surface, and the chemical interaction between the polymer and the filler surface.

SUB CODE: 07/

SUBM DATE: 06Oct65/

ORIG REF: 021/

OTH REF: 002

Card 1/1

L 2268-66 EWT(m)/EPF(c)/EWP(j)/T/ETC(m) WW/RM

ACCESSION NR: AP5022226

UR/0191/65/000/009/0030/0035

678.762.2-134.532:678.632.01:536.495

AUTHOR: Popov, V. A.; Druyan, I. S.; Lipatov, Yu. S.

TITLE: Thermomechanical properties of phenol-rubber compositions in the massive and foamed state

SOURCE: Plasticheskiye massy, no. 9, 1965, 30-35

TOPIC TAGS: thermomechanical property, foam plastic, thermosetting material, phenolformaldehyde, resin, nitrile rubber

ABSTRACT: Phenol-rubber compositions are used to prepare heat-stable foam plastics. In order to make a close study of the starting compositions and finished foam materials under various heating conditions, the authors used customary methods of evaluating the quality of thermosetting resins and thermomechanical methods of studying polymers. The curing rate and degree of curing of the phenol-rubber compositions are investigated. It is found that thermomechanical studies of such compositions can be used to justify and refine the experimentally determined parameters of their processing into foam plastics. Thermomechanical curves of various foam plastics show that all are in a vitreous state up to 120-130C, and that on further heating the properties change as a

Card 1/2

L 2268-66

ACCESSION NR: AP5022226

result of thermooxidative degradation. The experimental data describing the heat stability of the foam plastics by means of the change in their properties as a function of temperature are found to be in complete agreement with the thermomechanical data. The study confirms the usefulness of thermomechanical methods in studies of thermosetting polymer systems of complex composition. Orig. art. has: 9 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 019

OTHER: 001

Card

2/2